



SWIM The Current

System Wide Information Management

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Welcome Message from the Program Manager

Welcome to the fifth issue of our newsletter, *The Current*, distributed to Federal Aviation Administration (FAA) staff, SWIM Implementing Programs (SIPs), and other interested parties.

Since our last newsletter, I am proud to report that the SWIM team has continued to aggressively pursue our agenda for Fiscal Year (FY) 2011.

Our accomplishments include:

- Releasing the SWIM Segment 2 Technical Overview and draft Final Program Requirements.
- Going operational with the Integrated Terminal Weather System (ITWS) and the Corridor Integrated Weather System (CIWS) publication services.
- Conducting a demonstration of the Aeronautical Information Management (AIM) SWIM-compliant Special Use Airspace (SUA) Automated Data Exchange capability.
- Continuing our SWIM outreach activities, including the 2nd Annual SWIMposium and monthly brown bag sessions. In addition, representatives from the SWIM program met with stakeholders from abroad, including the Japanese Civil Aviation Bureau (JCAB) and the Civil Aviation Authority of China (CAAC).

It is an exciting time for the SWIM Program. We look forward to several major steps forward, including the implementation of Aircraft Access to SWIM (AAtS) as well as promoting enterprise-level Service-Oriented Architecture (SOA) governance. We also look forward to holding SWIM stakeholder meetings to discuss cross-National Air-space System (NAS) issues in the near future.

I encourage you to visit us for more information at www.SWIM.gov or email us with any questions at 9-ATOW-HQ-SWIM@faa.gov.

Thank you,
Ahmad Usmani

SWIM Accomplishments

Over the past few months, SWIM has made a number of achievements, of which the highlights include:

- The SWIM CIWS capability went operational on September 27, 2010. CIWS is a weather analysis and forecasting system designed to support the development and execution of convective weather impact mitigation plans for congested en route airspace.
- The 2nd annual SWIMposium was held on September 29, 2010. The SWIMposium is an informational panel designed to provide an overview of SWIM, describe what it means to other programs, highlight next steps, and allow an opportunity to answer all questions about SWIM.
- The SWIM Integration Facility (SIF) at the William J. Hughes Technical Center (WJHTC) expanded the SWIM Commercial off-the-Shelf (COTS) Product Repository (SCPR) by adding new repositories containing additional SWIM products and licenses. The SCPR is the distribution mechanism for the required software products and related components to SIPs for their use in the development of SWIM services. The SIF staff manages and validates versions of the software products with their dependencies for provision to the implementers of SWIM services.
- SWIM began holding monthly Brown Bag Sessions in October 2010. These events feature SWIM's Subject Matter Experts (SME) discussing various topics, such as the fundamentals of SOA, Enterprise Information Management, and Business Process Management.

Brown Bag Sessions have proven to be extremely successful. Over 200 people attended or dialed-in to the March 2011 session, "Registry/Repository in a SOA Environment." For those who cannot make it to these sessions, SWIM posts the presentations on its website, often with accompanying audio. ■

ITWS Service Now Operational

On January 25, 2011, the SWIM ITWS Segment 1 capability became operational. ITWS provides a real-time weather picture to traffic managers, allowing them to collaborate with dispatchers to route or re-route air traffic as necessary. SWIM provides the information technology infrastructure necessary for the sharing of ITWS weather products among aviation stakeholders.

This capability was developed by the ITWS development team at the Volpe National Transportation Systems Center in Cambridge, MA, employing FUSE Broker server technology that provides a bandwidth-efficient remote distribution point at the WJHTC in Atlantic City, NJ.

ITWS takes data from various existing FAA and National Weather Service (NWS) sensors and, using algorithms developed at

Massachusetts Institute of Technology's (MIT) Lincoln Labs, provides a suite of products, such as windshear and microburst detection and prediction. Windshear, sudden changes in wind speed or direction, and microbursts, local, short-lived down-drafts, can pose a great danger to aircraft and have played significant roles in high-profile accidents. ITWS applies algorithms to data collected by Terminal Doppler Weather Radar and Next-Generation Radar to predict windshear and microburst events and warn air traffic controllers.

Other ITWS products include convective weather impact, storm cells, precipitation, gust fronts, lightning, and tornadoes. SWIM provides the framework to share this critical information with stakeholders through a database accessible over the Internet. The data is available in an XML format, making

it easier for users to incorporate ITWS data into their resource management systems. With this information, stakeholders can know where weather-generated delays may occur and plan accordingly, better managing their resources. SWIM allows users to leverage the ITWS data using an industry-standard format, and to quickly incorporate it into their systems.

Currently, ITWS gets data from 34 major Terminal Radar Approach Controls (TRACONS) and Air Route Traffic Control Centers (ARTCC) in the United States (US). Four entities have subscribed to the prototype ITWS service: shipping giants United Parcel Service and FedEx, communications equipment company Harris Corp., and the U.S. Air Force Global Information Grid.

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AIM Demonstrates Initial Operating Capability

In the early hours of December 16, 2010, AIM demonstrated Initial Operating Capability (IOC) of the SWIM-compliant Special Use Airspace (SUA) Automated Data Exchange capability. The AIM SUA capability allows Special Activity Airspaces (SAAs) to be created, modified, and stored so that they will be available for scheduling. This capability is a key component in the accomplishment of the Next Generation Air Transportation System's (NextGen) goals to improve the capacity and efficiency of the NAS.

The Operational Repository will be installed at the MMAC in Oklahoma City, OK.

As part of IOC, a new SAA project was created and inserted into the Project Repository. The project was submitted as an SAA message to the Static Repository. Upon receipt of the project, the Static Repository published a message to the SAA Notification Topic via Java Message Service (JMS). The message was detected by the Operational Repository due to a durable subscription that had previously been established to the topic. The Operational Repository then proceeded to automatically retrieve the SAA project from the Static Repository. The process was repeated with a modification to the SAA project.

During IOC, access to the NAS Enterprise Security Gateway (NESG) was not available from FAA Headquarters; therefore, a communication link between the Static and Operational Repositories was enabled through a firewall rule that was opened specifically for the demonstration. The Project Repository and Static Repository hardware were located in the Orville Wright

Building at FAA Headquarters in Washington, D.C. and were operated remotely. The Operational Repository was located at the FAA Command Center in Herndon, VA.

As a result of the Command Center's upcoming move from Herndon to Warrenton, VA, the Operational Repository will be installed at the Mike Monroney Aeronautical Center (MMAC) in Oklahoma City, OK. It will reside on the NAS Operational Network with a connection to the NESG. The Project and Static Repositories will reside on the Mission Support Network in FAA Headquarters.

The demonstration of IOC had been delayed due to several factors, including the Command Center move; difficulty procuring Luciad software licenses; and bugs and unavailable functionality in the FUSE software. After the AIM Modernization hardware is deployed to its new sites, the capability will be retested using the final configuration and become fully operational in 2011. ■

AAtS on the Horizon

AAtS, previously described in our September newsletter, is a joint initiative between FAA's Systems Operations and SWIM through which an aircraft, even in flight, can access the information available through SWIM. This capability will give in-flight SWIM users the same information the FAA uses to make its Air Traffic Management (ATM) decisions.

Since the last issue of this newsletter, AAtS has come closer to being a reality. In November 2010, the AAtS working group met for

a third time. In February 2011, a white paper was published: *Aircraft Access to SWIM: Making SWIM Fly – Impacts and Challenges*.

Currently, AAtS is coordinating the development of an end-to-end system test plan with the FAA Florida NextGen Test Bed (FTB) at Daytona Beach. This activity would include technical tests and Human-in-the-Loop (HITL) tests with possible demonstrations of Notices to Airmen (NOTAMS).

Temporary Flight Restrictions (TFRs), and weather data. The AAtS target is to have a demonstration plan and Service-Level Agreement (SLA) for the tests completed in the spring of 2011 and schedule the first system test by the end of FY11. Additionally, input from aircraft operators, broadband data transport companies, and content and content management companies is being sought from an AAtS Aviation Outreach Study. This study is expected to address possible equipment solutions, validate known

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SWIM in Asia

中美SWIM和NextGen研讨会 China-U.S. NextGen Meeting & SWIM Workshops

Interest in the SWIM Program is not limited to the FAA, Department of Transportation (DOT), or even the US. Over the last six months, aviation authorities in both Japan and China met with the SWIM Team to discuss the program, its concept, and progress.

In early October 2010, representatives from the Japanese Civil Aviation Bureau (JCAB) came to Washington, D.C. to learn more about NextGen and SWIM at two-day Data Exchange and Trajectory-Based Operations (TBO) Workshop. Topics covered included SWIM-related activities, terminology, lessons learned, SOA, the NAS Service Registry/Repository (NSRR), governance, and SWIM's future plans.

The Workshop was the starting point of mutual cooperation between JCAB and FAA relating to data exchange for SWIM and other NAS programs. The spirit of this cooperation was made more evident later in October, when the US and Japan agreed to a bilateral "Open Skies" agreement to allow more airline cooperation on flights between North America and Asia.

Japan's counterpart to the US' NextGen is the Collaborative Actions for Renovation of Air Traffic Systems (CARATS). The CARATS ATM concept of operations (ConOps) highlights SWIM as critical to enabling Collaborative Decision Making (CDM). Accordingly, SWIM has a central place in the CARATS roadmap.

In December 2010, members of the SWIM team (Program Manager Ahmad Usmani, Implementation Team Lead Jeffrey Hobbs,



From L-R: SWIM Program Manager Ahmad Usmani, FAA International Office Program Manager Sam El-Zoobi, SWIM Requirements & Governance Team Lead Jim Robb, and SWIM Implementation Team Lead Jeff Hobbs.

and Requirements and Governance Team Lead Jim Robb) journeyed over 7,000 miles to Shenzhen, China. There, they conducted a 3-day workshop on the SWIM Program for the Civil Aviation Authority of China (CAAC).

First, Ahmad presented a high-level overview of the SWIM Program. Jim then presented technical details such as requirements, standards, and compliance as they relate to SWIM. Next, Jeff presented more information on SWIM Segment 1 implementation and the program's work with SWIM SIPs. Finally, CAAC briefed the SWIM Team on their progress regarding SWIM, which is a pressing matter for Chinese aviation. While U.S.

En Route facilities have standard hardware and software configurations, the Chinese equivalents do not, making information that much more difficult to share.

In March 2011, the WJHTC in Atlantic City hosted a delegation from CAAC that included that organization's Deputy Director General and five other officials. Over the course of an hour, the SWIM lab lead Bud Timoteo gave an overview of the SWIM Program, an NSRR briefing and demonstration, and a demonstration of the LISA Test software. Representatives from CAAC are scheduled to travel to Washington, D.C. to meet with the SWIM team in August 2011. ■

SWIM Segment 2: Authorized to Proceed

In November 2010, the SWIM Program received approval for all of its requested decisions from the Joint Resources Council (JRC) in connection with the SWIM Segment 2 Authorization to Proceed (ATP).

An ATP is similar to a Final Investment Decision (FID), except an ATP is used when costs require further refinement to ensure the proper funding allocation. The JRC decisions included those on SWIM Governance, approval of SWIM Segment 2 planning funding, and an ATP with the preferred alternative.

The most significant decision from the JRC centered on SWIM's SOA governance. The key to the governance decision was that SWIM will support the Enterprise Architecture Board/Technical Review Board (EAB/TRB) in ensuring that SOA governance complies with NAS regulations.

As depicted in Figure 1, SWIM will provide recommendations to the EAB/TRB

through a SOA suitability assessment, but the final approval of SWIM-compliant NAS services will reside with the EAB/TRB.

The goal of SWIM SOA governance is to ensure functionalities are not needlessly replicated, leading to increased expense to the FAA. As a result of the decision, programs will use the enterprise SOA infrastructure that is provided by SWIM and meet SWIM-compliance requirements, as required by the EAB/TRB. SWIM governance will build upon existing FAA Acquisition Management System (AMS) policies and FAA standards as a way to minimize the impact to programs. SWIM will continue to conduct SOA suitability assessments on all investment decisions early in the lifecycle to provide the appropriate compliance guidance as it was doing prior to the ATP.

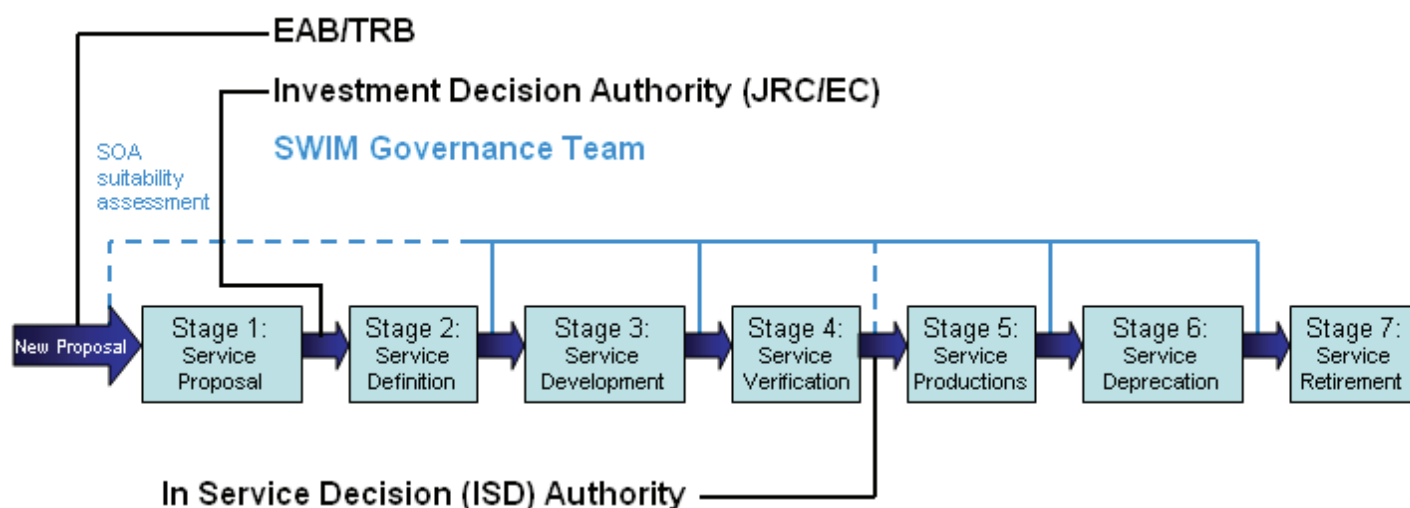
SWIM received approval for planning money for FY11-12 and a hold on acquisition funding for FY12-13. The program will

conduct activities leading up to an expected SWIM Segment 2 FID in 2012 with this funding, including Segment 2 planning, investment analysis, and a series of prototyping activities.

The JRC approved SWIM to proceed with the preferred alternative, which is for SWIM to provide the enterprise SOA infrastructure within the NAS for individual programs to use. This approach enables programs to focus on providing the services that are key to their mission while minimizing the impact of becoming SOA-compliant.

The approval of SWIM's ATP signals that the FAA remains committed to the SWIM Program and to developing a SOA-compliant foundation for agency programs. The SWIM Program has a tremendous amount of work to do in preparation for a FID in 2012, but the pieces have been set in motion for the continued success of this transformational program. ■

Figure 1: SOA Governance Process



Developments in SWIM Oversight

SWIM has undergone, or is currently undergoing, audits on various levels of the program. Beginning in the spring of 2009, the DOT Office of Inspector General (OIG) examined the strengths and weaknesses for developing and funding SWIM efforts and the effectiveness of the SWIM plan to identify and manage key risks affecting a nationwide deployment. In addition to interviewing SWIM staff at FAA Headquarters in Washington, D.C., the OIG Evaluation Team visited the Volpe National Transportation Systems Center in Cambridge, MA to observe the ITWS-SWIM prototype, and the WHJTC in Atlantic City, NJ. The OIG team visited two facilities at the WJHTC: the SWIM Prototyping and Support Facility that contains the hardware and software necessary to support SWIM prototyping and evaluation activities; and the SWIM Integration Facility (SIF) that releases versions of the service container software maintained in the SWIM COTS product repository.

The SWIM Team met with the OIG in December 2010 to discuss its preliminary findings and is awaiting issue of the final draft.

In December 2010, SWIM was selected to undergo a Tier 3 Acquisitions Practices evaluation. Defined as “a deep-level evaluation of a program’s compliance to phase-required practice products generated during the SI [Solution Implementation] and/or ISM [In-Service Management] phases,” a Tier 3 evaluation is conducted on a FAA Acquisition program post-FID. Sponsored

by the FAA’s Office of Financial Services (ABA-001) and its Internal Controls Division (AFR-200), SWIM is the first program undergoing a Tier 3 evaluation using the Acquisitions Practices model.



Seven Practices were reviewed in connection with the Tier 3 evaluation:

1. Program Management
2. Quality Assurance
3. Contractor Management
4. Risk Management
5. Requirements Management
6. Measurement & Analysis
7. Validation & Verification

In addition to the specific requirements defined in the Discipline-Based Toolkits, the Team looked at current plans and schedules, dated artifacts, records of completion, signed plans, and managerial oversight.

The SWIM Team met with the Acquisitions Evaluation Team in February 2011 and is awaiting the final report.

At the request of the House Transportation and Infrastructure, House Science and Technology, and the Senate Commerce Committees, the Government Accountability Office (GAO) currently is evaluating the FAA’s major Air Traffic Control (ATC) programs. The focus of this review is three-fold: 1) how costs and schedules of current FAA major acquisition projects have changed, 2) reasons for those changes, and 3) challenges.

SWIM had its kick-off meeting on February 10, 2011. ■

*SWIM is the first
Tier 3 evaluation
using the
Acquisitions
Practices model.*

Initial Mobile Object Technology Capability Evaluations

Setting the stage for a final evaluation in June 2011, Topia Technology, Inc. completed an initial Capability Evaluation presentation and demonstration to help determine if there may be a role for the Kolona™ Resource Management (KRM) software in NextGen. Two presentation and demonstration sessions were held on January 26, 2011, in Washington, D.C. Topia held a third session at the WJHTC in Atlantic City, NJ the following day with the assistance of SWIM lab lead, Bud Timoteo.

The snow that wreaked havoc on the East Coast did not seem to hinder the attendance

of these events. Approximately 30 FAA and industry engineers attended these sessions. Each session concluded with a question and answer (Q&A) segment. These discussions were captured for future use by SWIM support personnel in structuring the final Capability Evaluation in June 2011. The final document for this Capability Evaluation will be posted on the SWIM website.

The Capability Evaluation used the KRM framework to move and manage resources in a SOA environment—in this case, a notional SWIM environment. Specific movement and management scenarios presented directly relate to specific SWIM Segment 2 requirements.

During the demonstration, KRM was used to interface with a notional system administrator's use of OSGi services in the SWIM SOA container. KRM resource movement was successful in all scenarios. It was used by the notional administrator to move OSGi bundles to the target destinations on the notional SWIM. KRM was also used to manage these OSGi bundles consistent with a Fuse ESB.

Demonstration scenarios highlighted key KRM strengths:

- KRM can perform multiple administrative tasks involving diverse resources without the need for ad hoc resource movement and management tools.
- KRM enhances security and integrity by automating previously manual tasks.

Additional documents explaining Topia's Kolona™ Mobile Object Technology (MOT) and what has been accomplished to potentially satisfy SWIM and NAS needs are available on the www.SWIM.gov website.

SWIM points of contact (POCs) for the project are Mike Hritz (mike.hritz@faa.gov) and Rick Helfers (ehelfers@northstargroupplc.com).

For more information on Kolona™, including its use in other Federal agencies, visit www.topiatechnology.com. ■

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SWIM Q&A



The SWIM Program posted a list of commonly asked Q&As on www.SWIM.gov. In each edition of *The Current*, a few questions and responses are highlighted.

Will the SWIM Program Improve Aviation Safety?

Yes. SWIM will help improve aviation safety through increased common situational awareness. The program allows more decision makers to access the same information. This will provide consistent information to different users (i.e., pilots, controllers, and dispatchers) that support proactive decision-making.



Will SWIM Help Reduce Passenger Delays and Flight Congestion?

Yes. SWIM is essential to providing the most efficient use of airspace, managing air traffic around weather, and increasing common situational awareness on the ground. SWIM core services will enable systems to request and receive information when they need it, subscribe for automatic receipt, and publish information and services as appropriate. These capabilities will provide for the sharing of information across

different systems and allow airspace users and controllers to access the most current information affecting their area of responsibility more efficiently.

SWIM will improve decision making and streamline information sharing for improved planning and execution. These enhancements may result in fewer delays at major airports. It also may help reduce fuel costs for airlines by avoiding unnecessary reroutes around severe weather by providing the latest information, including more efficient alternatives. ■

ITWS Service Now Operational

(Continued from page 2)

A number of participants from industry have expressed an interest in receiving the ITWS data through this new interface. Industry users will receive the ITWS weather products by connecting to the FAA's National Airspace System Enterprise Security Gateway located at the WJHTC.

At the present time, this SWIM Segment 1 capability only services external users, while internal users access ITWS data directly. ■

AAAtS on the Horizon

(Continued from page 3)

technical issues, identify other technical design and implementation challenges, and obtain commitments of interest and resources from the aviation community.

By supporting the activities critical to achieving a common operating picture between the ground and air, AAAtS is critical to the agency's NextGen goals and to implementing Operation Improvements. AAAtS neither replaces existing or planned systems nor requires creating new supporting infrastructure. AAAtS defines the requirements necessary to use commercially available ground-to-air broadband medium to provide SWIM-enabled

NAS information into the cockpit. AAAtS is intended to leverage existing or planned equipment, standards, and requirements as much as possible.

Due to the complexity of AAAtS, critical questions remain unanswered, including:

- How AAAtS will interact with individual NAS systems and what new requirements may be placed on those systems by AAAtS.
- What the best method to deliver impact resolutions will be.
- What the global interoperability standards will be.
- How AAAtS will relate to the existing aviation regulation framework. ■

Practitioner Profile: Mike Hritz

The SWIM Evolution & Coordination Team Lead, Mike Hritz, looks ahead, thinking about how SWIM will grow and how it will relate with and incorporate into the future NAS.

The “Evolution” part of Mike visualizes concepts like SWIM Segment 3 capabilities. The “Coordination” part determines with whom and how the program will interact, for example the program’s collaboration with organizations like the Joint Planning & Development Office (JPDO) and Europe’s Single European Sky Air Traffic Management Research Program Joint Undertaking (SESAR JU). In addition, the Evolution & Coordination team evaluates Mobile Object Technology (MOT), such as that developed by Topia (see page 7 for the article on recent Topia demonstrations).



Mike has been with the SWIM Program before it was SWIM. He was working on it since it was the Global Communications, Navigation and Surveillance System (GCNSS) Program as an assistant engineering manager. He joined the agency in 1997 after working in signals warfare for the U.S. Army. Signals warfare is the opposite of the SWIM Program. Now called command and control warfare, Signals warfare encompasses all the military tactics that use communications technology, but to disrupt the flow of necessary information. He earned his undergraduate degree in aerospace engineering from Pennsylvania State University and a master’s degree in systems engineering from George Mason University.

One of the current SWIM activities that has Mike excited is a capability called AATs (see article on page 3).

For leisure, Mike develops the Enterprise Service Roadmap and the NextGen NAS SV-4 Framework for the NAS Enterprise Architecture Group.

Mike lives in Maryland with his wife of four years, Pam, who is a painting conservator. The Bethel Park, PA native plays hockey, enjoys a magnificent golf game, scuba dives, and rides his dolphin blue 1999 BMW K1200 RS motorcycle. ■

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We welcome you to visit our site. We will make every effort to keep content new and to apprise stakeholders of current activities.

If you have a suggestion or information to contribute to our website, please contact the Communications team at 9-ATOW-HQ-SWIM@faa.gov. ■

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All documents are available to the public on the SWIM external website at www.SWIM.gov.